

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



533369

(43) International Publication Date  
21 May 2004 (21.05.2004)

PCT

(10) International Publication Number  
**WO 2004/041417 A1**

(51) International Patent Classification<sup>7</sup>: **B01D 53/62**

(21) International Application Number:  
PCT/US2003/034978

(22) International Filing Date:  
3 November 2003 (03.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/423,165 1 November 2002 (01.11.2002) US

(71) Applicant (*for all designated States except US*): NU-VERA FUEL CELLS, INC. [US/US]; 35 Acorn Park, Cambridge, MA 02140-2390 (US).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): HAGAN, Mark, R. [US/US]; 72 Eustis Street, Apartment 2, Cambridge, MA 02140-2204 (US). POLLICA, Darryl [US/US]; 8 King Avenue, Apt. 1L, Medford, MA 02155 (US). FULLER, Ware [US/US]; 5 Townsend Road, Acton, MA 01720 (US). MAGNER, Shane [US/US]; 1666 Commonwealth Avenue - #36, Brighton, MA 02135 (US).

(74) Agent: MORNEAULT, Monique, A.; Wallenstein Wagner & Rockey, Ltd., 311 South Wacker Drive - 5300, Chicago, IL 60606 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

WO 2004/041417 A1

(54) Title: DISTRIBUTION OF AIR FOR CARBON MONOXIDE REMOVAL IN A REFORMATE

(57) Abstract: Several air inputs are typically required in removal of carbon monoxide from a fuel reformatte, particularly when using the reformatte in a PEM (polymer electrolyte membrane) fuel cell. Control can be greatly simplified by distributing the air or oxygen among the inlets in a fixed ratio using a fixed dimension flow path, such as sized orifices, conduits, and the like, and selecting the total oxygen input to the system based on the operating state of the system and its operating map.